PROGRAMME SPECIFICATION		Newcastle University

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	MA
4	**Programme Title**	MA_Architectural Design Research
5	**Programme Code**	4119
6	**Programme Accreditation**	N/A
7	**QAA Subject Benchmark(s)**	N/A
8	**FHEQ Level**	7
9	**Last updated**	23.04.11

10	**Programme Aims**

1 to establish an internationally-distinctive programme of study focused on the relations between architecture and the contemporary global city, which produces innovative design-based research recognised to be of the highest quality

2 to produce highly-skilled and informed graduates who understand the importance of architecture as a form of cultural production and its responsibilities to the city, and who are able to act with initiative, deploying with sophistication a wide-range of knowledges and skills

3 to engage with various agencies and interest groups already active in the cities being studied and – through the generation of design projects – to positively participate in and affect ongoing debates regarding their future development

4 to provide a programme that has synergy with – and relevance for – existing and future initiatives in HaSS related to creative practice and industry

5 to develop advanced research skills, the ability to critically evaluate and utilise current research, and to generate directions for further study that open onto to PhD routes (in particular by creative practice)

6 to diversify and enrich post-graduate studies in architecture by interlinking with other new masters initiatives

7 to meet the criteria for Postgraduate Diploma and Masters level qualifications as laid down in the QAA's National Qualifications Framework

8 to comply with University policy and QAA Codes of Practice

11	**Learning Outcomes**

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas.

Knowledge and Understanding

On completing the programme students should:

A1   Demonstrate understanding, through both analysis and design-based research, of a significant contemporary urban condition and the range of factors that affect it, and display knowledge of how to act upon this in the development and resolution of a sophisticated architectural proposal.

A2   Show a developed knowledge and appreciation of – and ability to strategically conceptualize – the role of the architect, and the potentiality of the architectural project, in their relation to the complex array of agencies and interests that converge on the city.

A3   Demonstrate critical knowledge of the range of representational techniques available to the architect, and the ability to strategically productively and meaningfully deploy them in the design process and for public engagement (via exhibitions, etc.)

A4   Display an understanding of the relations between architectural history, theory and practice, as manifested through a self-defined and successfully-pursued programme of research focused on questions that have emerged from the student's own design work.

(see annex for mapping of learning outcomes onto modules, teaching and learning methods and assessment strategy)

Teaching and Learning Methods

Achievement of A1, A2, and A3 are staged through the two 40-credit studio modules, Design Research Studio 1 and Design Research Studio 2. Through a series of interlinked project stages that operate within these, students are led through an unfolding design process that is framed in relation to a series of questions and tasks that are identified in the project briefs that are issued at the beginning of each stage and to which the students have to respond. Teaching and learning in the design studios is structured in relation to a tutorial system, in which each student is allocated a 45 minute intensive tutorial each week. These are used to review the development of the work to date, discuss possibilities and directions for its development, and agree goals to be achieved for the next meeting. Typically this will involve aspects of documentary research (material to be identified and studied, readings to be undertaken, etc.) and practice, which mobilises and acts upon that (drawings, models, constructions, to be prepared, etc). In addition, a lecture will introduce and contextualise – and a seminar support – each of the project stages.

A4 is mainly delivered through the ADR Dissertation module, in which the emphasis is on more self-directed research and learning, although it is supported through introductory lectures, two intensive workshops and tutorials.

Assessment Strategy

Assessment will be based on project work, as well as verbal and written evidence that the required level of achievement has been reached.   A1, A2 and A3 are integrated within the project work that is developed across Design Research Studio 1 and Design Research Studio 2, and assessment will be based on this, together with the final exhibition and evidence of the student's self-understanding of work drawn from his/her presentation at the formal public project reviews. A4 is assessed through the ADR Dissertation of between 10,000-12,000 words.

Intellectual Skills

On completing the programme students should be able to:
B1   Rigorously develop and elaborate an idea, from the abstract to the specific and through increasing degrees of complexity, working with a range of different media.
B2   Demonstrate the ability to accurately imagine relations of space and material and to think creatively with drawings, models, physical constructions, etc.
B3   Demonstrate skills in discursively presenting creative work, in terms of both exploration and participation in debate, criticism and discussion.
B4   Formulate and pursue well-defined research questions and demonstrate the ability to critically reflect upon, intellectually situate and assess architectural design work, and to develop well-formulated argumentation accordingly.

(see annex for mapping of learning outcomes onto modules, teaching and learning methods and assessment strategy)

Teaching and Learning Methods
As they elaborate their project from concept to realisation across Design Research Studio 1 and Design Research Studio 2, supported by the intensive sequence of tutorials, students acquire the skills outlined in B1. Representations of various kinds, as noted in B2, are the vehicles through and with which students think, and form the principal tools and objects of the design studios. The tutorial system is dependent upon an ongoing dialogue between tutor and student, during which ideas are articulated and discussed. This is one aspect of B3, but students will also be in involved in group work during Design Studio 1, when they will have to collectively debate decisions and actions. In addition, at the end of each project stage, students must formally present their work to a public review panel, which will include invited guests. The cognitive skills outlined in B4 are developed through the design research developed in the two principal studios, but also importantly in the dissertation during which the students' work is reflected upon and extended through a process of discursive research.

Assessment Strategy
B1, B2, B3 and B4 are all assessed through the project work and its presentations as carried out in Design Research Studio 1 and Design Research Studio 2. In addition, the ADR Dissertation tests the skills in B4 as they relate to discursively-grounded research.

Practical Skills
On completing the programme students should be able to: C1   Effectively conduct both primary and secondary research, strategically mobilising resources ranging from archives and libraries to databases and web resources. C2   Plan and undertake practical field-work activities where appropriate to the research programme being pursued. C3   Develop, manage and implement programmes of practice-based and discursive research with respect to given deadlines. C4   Skilfully assemble, design, format and present a major document, incorporating both text and images, using desktop publishing software. (see annex for mapping of learning outcomes onto modules, teaching and learning methods and assessment strategy)

Teaching and Learning Methods
Skills C1 and C3 are honed through the Design Research Studios and the Dissertation, as supported by tutorials and occasional lectures and seminars. In the case of the design research work, the framing of the student's projects will be facilitated by the course material issued (the briefs for the project stages) and directed by direct discussion with the tutor. In the case of the dissertation, guidance is provided at 2 strategic points by workshops: the first will introduce the dissertation and discussing methodology and technique while the second will examining issues of structure, argument, format, explicitly addressing skills noted in C4. The field trip in the middle of Semester 1 is a crucial part of the programme, and students will prepare for it (C2) through the first project issued in Design Research 1. This will be motivated by questions of knowledge and practice in relation to field-work, and will equip students with ideas and processes that can be utilised during the visit. The students' ongoing work will be discussed with them in an intensive series of tutorials during the field trip.

Assessment Strategy
C2 – and to a lesser extent, C1 – is tested through the initial project in Design Research Studio 1, and through a field-work portfolio, which students will be asked to assemble, which documents their study. C1 and C3 are tested through the development of the students research across the programme, as manifested in the project work produced in Design Research Studio 1 and Design Research Studio 2 and in the discursive ADR Dissertation. The latter is the point at which C4 is tested.

Transferable/Key Skills

On completing the programme students should be able to:
D1   Show wide-ranging ability to analyze complex problems and develop creative responses.
D2   Demonstrate competence and aptitude in a wide variety of different digital programmes and techniques, and excellence in some.
D3   Communicate effectively to others through public presentations and to peers and colleagues when working in a group.
D4   Exercise initiative, self-motivation and personal responsibility.

(see annex for mapping of learning outcomes onto modules, teaching and learning methods and assessment strategy)

Teaching and Learning Methods

The trajectory of the students projects through Design Research Studio 1 and Design Research Studio 2 demands continual problem analysis, dealing with different scales and objects, and creative responses to those (D1), as well as personal initiative, commitment and a high degree of motivation (D4). Students will develop skills in communicating and articulating their work (D3) in tutorials, group work situations, and in the formal public reviews that conclude each project stage during which students present their work before invited guests. Students will typically work with sophisticated 3-D drawing, modelling and visualisation software, and image manipulation programmes in the design research studios, and with desktop publishing software in the ADR Dissertation modules (D2)

Assessment Strategy

D1, D3 and D4 are assessed through the submissions for all required modules, while D3 is specifically assessed through the group-work in Design Research Studio 1 and through the public project review presentations that are part of both Design Research Studios.

12   Programme Curriculum, Structure and Features
Basic structure of the programme

The MA_ADR programme is built up out of 180 credits across 3 semesters (60 credits per semester with the 3 semesters running in total for 1 full calendar year). The programme contains 140 credits of compulsory modules, thus making 40 credits worth of optional modules, 20 credits in Semester 1 and 20 credits in Semester 2, which students may choose from an approved list. As well as allowing reciprocities with other new masters programmes in the School of Architecture, Planning and Landscape such as the MA_Architectural Theory and Criticism and the MA_Future Landscape Imaginaries, these options allow modules offered by the School of Arts and Cultures and the School of Geography, Politics and Sociology to be taken. A full list of approved modules is give on the MA_ADR programme regulation document

The structure is as shown on the diagram below:

Semester 1	Semester 2	Semester 3
Design Research Studio 1 (40)	Design Research Studio 2 (40)	ADR Dissertation (60)
Option (20)	Option (20)	

The programme is driven by two intensive 40-credit design studios that run in Semester 1 and Semester 2 and which represent progressive stages in the development of students' projects. The compulsory modules are as follows:

Design Research Studio 1 (Semester 1, 40 credits): This intensive studio, which incorporates a field trip, introduces the MA_ADR programme. Each year the work of the programme is concentrated on a particular city and is co-ordinated through a specific theme. This module opens the student's investigation through an interlinked series of projects that stimulate ways of thinking about the city and the theme and that lead toward the development of a design strategy that connects the urban with the architectural. Throughout, students will be encouraged to think and act critically with regard to the representations (drawings, models, constructions, etc.) that they make and work with.

Design Research Studio 2 (Semester 2, 40 credits): This studio builds upon the work carried out in Design Research Studio 1, taken in Semester 1. It emphasizes the elaboration and resolution of each student's individual work within the overall parameters established in the first semester. During the studio, students will intensively elaborate detailed architectural propositions that respond to the larger urban strategies that they have developed in the programme to date. By the end of the semester the aim is to have produced fully-realized architectural proposals that are powerfully conveyed through an intelligent and strategic use of representational media.

ADR Dissertation (Semester 3, 60 credits): The third-semester MA_ADR Dissertation module gives students the opportunity to develop their ongoing investigations, as elaborated to date through the Design 1 and Design 2 modules. The dissertation allows an intense period of study and research in which students are asked to extend the conceptual and theoretical aspects of their work, critically reflecting upon it and situating it in relation to positions in contemporary architectural discourse. This will involve the development of an independent and original set of research questions, and the formulation of the student's own programme of in-depth research that draws on interests, techniques and understandings already developed.

Key features of the programme (including what makes the programme distinctive)

This innovative design-based masters programme focuses on the relations between architecture and the complex conditions of the contemporary city. It is aimed at students who have already completed their academic training in architecture, although they need not have gained their full professional qualification in order to be eligible for entry onto the degree. Over the course of three semesters, the programme allows students to research and develop highly articulated architectural propositions for urban sites. Each year the work of the programme will be concentrated on a particular city and will be co-ordinated through a specific theme. Cities and themes will be advertised on the programme's website 3 years in advance, allowing prospective students to identify locations and topics of study that specifically interest them and to plan their entry onto the degree accordingly. In addition, such long-term planning will facilitate the development of links and engagements with various agencies and interest groups in the cities being studied.

Focused on relations between architecture and the city, this programme will support the development of speculative design projects that operate across the full range of architectural scales, from urban strategy to detail. This breadth of engagement is highly distinctive. Likewise its structure offers something new, insofar as the work of the students on the programme is co-ordinated by theme and location, which will allow the work produced in the programme to accumulate year by year into a series of studies of global cities that connect urban and cultural analysis with creative practice and architectural speculation, establishing Newcastle University as a centre for architectural design research.

The proposer has deep experience in design research pedagogy and is internationally renowned in this field, holding visiting professorships in the USA and China. These relations will facilitate the visibility of the programme and international recruitment onto it.

The programme has a strategic relation with the recently introduced PhD route by creative practice in APL, as well as the new raft of architecture masters programmes (Architectural Criticism and Theory; Future Landscape Imaginaries; etc.) whose Semester 1 modules will be available as options to MA_ADR students. Moreover, by drawing upon a range of relevant modules offered in the School of Arts and Cultures and the School of Geography, Politics and Sociology, the programme makes available a constellation of learning opportunities, expertise and skills to students that is quite unique for programmes of this kind. Architectural design involves critical and analytical thinking and representational and media skills, and both of these are enhanced by the module options available.

In addition, the strength of research units in Newcastle University such as the Global Urbanism Research Unit (GURU), centres such as Culture Lab, and emerging initiatives such as the Newcastle Institute for Creative Arts Practice (NICAP) give many possibilities for synergy.

Programme regulations (link to on-line version)

http://www.ncl.ac.uk/regulations/programme/

13	**Criteria for admission**

Entry qualifications
Applicants must hold a good degree in architectural design from an accredited programme (ARB/RIBA Part 2, or equivalent level for international students).

Admissions policy/selection tools
All applications to be forwarded to DPD as selector.

Non-standard Entry Requirements

Additional Requirements
Applicants must submit a digital portfolio in pdf format. This document is to be prefaced with a 500-word statement that outlines the applicant's architectural interests and aspirations, indicating what she or he hopes of achieve on the MA_ADR programme. Reference to the portfolio will form a crucial part of the selection process.

Level of English Language capability
IELTS 6.5 (or equivalent)

14	**Support for Student Learning**

The Student Services portal provides links to key services and other information and is available at: *http://www.ncl.ac.uk/students/*

Induction
During the first week of the first semester students attend an induction programme. New students will be given a general introduction to University life and the University's principle support services and general information about the School and their programme, as described in the Degree Programme Handbook. New and continuing students will be given detailed programme information and the timetable of lectures/practicals/labs/ tutorials/etc. The International Office offers an additional induction programme for overseas students.

Study skills support
Students will learn a range of Personal Transferable Skills, including Study Skills, as outlined in the Programme Specification. Some of this material, e.g. time management is covered in the appropriate Induction Programme. Students are explicitly tutored on their approach to both group and individual projects.

Numeracy support is available through Maths Aid and help with academic writing is available from the Writing Centre (further information is available from the Robinson Library).

Academic support
The initial point of contact for a student is with a lecturer or module leader, or their tutor (see below) for more generic issues. Thereafter the Degree Programme Director or Head of School may be consulted. Issues relating to the programme may be raised at the Staff-Student Committee, and/or at the Board of Studies.

Pastoral support
All students are assigned a personal tutor whose responsibility is to monitor the academic performance and overall well-being of their tutees. In addition the University offers a range of support services, including one-to-one counselling and guidance or group sessions / workshops on a range of topics, such as emotional issues e.g. Stress and anxiety, student finance and budgeting, disability matters etc. There is specialist support available for students with dyslexia and mental health issues. Furthermore, the Union Society operates a Student Advice Centre, which can provide advocacy and support to students on a range of topics including housing, debt, legal issues etc.

Support for students with disabilities
The University's Disability Support Service provides help and advice for disabled students at the University - and those thinking of coming to Newcastle. It provides individuals with: advice about the University's facilities, services and the accessibility of campus; details about the technical support available; guidance in study skills and advice on financial support arrangements; a resources room with equipment and software to assist students in their studies.

Learning resources
The University's main learning resources are provided by the Robinson and Walton Libraries (for books, journals, online resources), and Information Systems and Services, which supports campus-wide computing facilities.

All new students whose first language is not English are required to take an English Language Proficiency Test. This is administered by INTO Newcastle University Centre on behalf of Newcastle University. Where appropriate, in-sessional language training can be provided. The INTO Newcastle University Centre houses a range of resources which may be particularly appropriate for those interested in an Erasmus exchange.

| 15 | Methods for evaluating and improving the quality and standards of teaching and learning |

Module reviews
All modules are subject to review by questionnaires which are considered by the Board of Studies. Changes to, or the introduction of new, modules are considered at the Board of Studies and/or the School Teaching and Learning Committee. Student opinion is sought at the Staff-Student Committee and/or the Board of Studies. New modules and major changes to existing modules are subject to approval by the Faculty Teaching and Learning Committee.

Programme reviews
The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to Faculty Teaching and Learning Committee. The FTLC takes an overview of all programmes within the Faculty and reports any Faculty or institutional issues to the University Teaching and Learning Committee.

External Examiner reports
External Examiner reports are considered by the Board of Studies. The Board responds to these reports through Faculty Teaching and Learning Committee. External Examiner reports are shared with institutional student representatives, through the Staff-Student Committee.

Student evaluations
All modules, and the degree programme, are subject to review by student questionnaires. Informal student evaluation is also obtained at the Staff-Student Committee, and the Board of Studies. The results from student surveys are considered as part of the Annual Monitoring and Review of the programme and any arising actions are captured at programme and School / institutional level and reported to the appropriate body.

Mechanisms for gaining student feedback
Feedback is channelled via the Staff-Student Committee and the Board of Studies.

Faculty and University Review Mechanisms
The programme is subject to the University's Internal Subject Review process. Every five years degree programmes in each subject area are subject to periodic review. This involves both the detailed consideration of a range of documentation, and a two-day review visit by a review team which includes an external subject specialist in addition to University and Faculty representatives. Following the review a report is produced, which forms the basis for a decision by University Teaching and Learning Committee on whether the programmes reviewed should be re-approved for a further five year period.

Accreditation reports

Additional mechanisms

16	Regulation of assessment

Pass mark
The pass mark is 50%

Course requirements
Progression is subject to the University's Masters Degree Progress Regulations, Taught and Research and Examination Conventions for Taught Masters Degrees. Limited compensation up to 40 credits of the taught element and down to a mark of 40% is possible and there are reassessment opportunities, with certain restrictions.

The University employs a common marking scheme, which is specified in the Taught Postgraduate Examination Conventions, namely:

Summary description applicable to postgraduate Masters programmes		**Summary description applicable to postgraduate Certificate and Diploma programmes**	
<50	Fail	<50	Fail
50-59	Pass	50 or above	Pass
60-69	Pass with Merit		
70 or above	Pass with Distinction		

Role of the External Examiner
An External Examiner, a distinguished member of the subject community, is appointed by Faculty Teaching and Learning Committee, following recommendation from the Board of Studies. The External Examiner is expected to:
   i.   See and approve assessment papers
   ii. Moderate examination and coursework marking
   iii. Attend the Board of Examiners
   iv. Report to the University on the standards of the programme

In addition, information relating to the programme is provided in:

The University Prospectus: http://www.ncl.ac.uk/postgraduate/

The School Brochure http://www.ncl.ac.uk/marketing/services/print/publications/ordering/

Degree Programme and University Regulations: http://www.ncl.ac.uk/regulations/docs/

The Degree Programme Handbook

Please note. This specification provides a concise summary of the main features of the programme and of the learning outcomes that a typical student might reasonably be expected to achieve if she/he takes full advantage of the learning opportunities provided. The accuracy of the information contained is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education.

Mapping learning outcomes (Compulsory Modules) on to modules, teaching & learning methods, assessment

Intended learning outcomes	Where are they taught?	How are they taught?	How are students enabled to learn?	Assessed?	How assessed?
A1	ARC8104, ARC8105,	Primarily individual tutorials, with occasional lectures, seminars, and project reviews.	Course documentation (project briefs), intensive system of tutorials, public reviews, independent research and learning	Yes	Project work, presentation at reviews, exhibition
A2	ARC8104, ARC8105	Primarily individual tutorials, with occasional lectures, seminars, and project reviews.	Course documentation (project briefs), intensive system of tutorials, public reviews, independent research and learning	Yes	Project work, presentation at reviews, exhibition
A3	ARC8104, ARC8105,	Primarily individual tutorials, with occasional lectures, seminars, and project reviews.	Course documentation (project briefs), intensive system of tutorials, public reviews, independent research and learning	Yes	Project work, presentation at reviews, exhibition
A4	ARC8103	Lectures, workshops, tutorials	Independent research and learning, presentations in small groups and publicly, tutorials	Yes	Dissertation

Intended learning outcomes	Where are they taught?	How are they taught?	How are students enabled to learn?	Assessed?	How assessed (primarily)?
B1	ARC8104, ARC8105,	Primarily individual tutorials, with occasional lectures, seminars, and project reviews.	Course documentation (project briefs), intensive system of tutorials, public reviews, independent research and learning	Yes	Project work, presentation at reviews, exhibition
B2	ARC8104, ARC8105	Primarily individual tutorials, with occasional lectures, seminars, and project reviews.	Course documentation (project briefs), intensive system of tutorials, public reviews, independent research and learning	Yes	Project work, presentation at reviews, exhibition
B3	ARC8104, ARC8105	Primarily individual tutorials, with project reviews.	Group work, intensive system of tutorials, public reviews.	Yes	Presentation at reviews
B4	ARC8104, ARC8105, ARC8103	Primarily individual tutorials, with lectures, seminars, workshops and project reviews.	Course documentation (project briefs), intensive system of tutorials, public reviews, independent research and learning, presentations in small groups and publicly	Yes	Project work, presentation at reviews, exhibition, dissertation

Intended learning outcomes	Where are they taught?	How are they taught?	How are students enabled to learn?	Assessed?	How assessed (primarily)?
C1	ARC8104, ARC8105, ARC8103	Primarily individual tutorials, with lectures, seminars, workshops, and project reviews.	Course documentation (project briefs), intensive system of tutorials, public reviews, independent research and learning, presentations in small groups and publicly	Yes	Project work, presentation at reviews, exhibition, dissertation
C2	ARC8104	Primarily individual tutorials, with occasional lectures, seminars, and project reviews.	Course documentation (project briefs), intensive system of tutorials, independent research and learning	Yes	Project work, presentation at reviews, fieldwork portfolio
C3	ARC8104, ARC8105, ARC8103	Primarily individual tutorials, with lectures, seminars, workshops, and project reviews.	Course documentation (project briefs), intensive system of tutorials, public reviews, independent research and learning, presentations in small groups and publicly	Yes	Project work, presentation at reviews, exhibition, dissertation
C4	ARC8103	Skills introduced and utilised throughout course, and in workshop during	Tutorials, workshop exercise	Yes	Dissertation

Intended learning outcomes	Where are they taught?	How are they taught?	How are students enabled to learn?	Assessed?	How assessed (primarily)?
		dissertation			
D1	ARC8104, ARC8105	Primarily individual tutorials, with occasional lectures, seminars, and project reviews.	Course documentation (project briefs), intensive system of tutorials, public reviews, independent research and learning	Yes	Project work, presentation at reviews, exhibition
D2	ARC8104, ARC8105, ARC8103	Primarily individual tutorials, with lectures, seminars, and workshops,	Course documentation (project briefs), intensive system of tutorials, independent learning, workshop exercise	Yes	Project work, exhibition, dissertation
D3	ARC8104, ARC8105	Primarily individual tutorials, with project reviews.	Group work, intensive system of tutorials, public reviews	Yes	Presentation at reviews
D4	ARC8104, ARC8105, ARC8103	Primarily individual tutorials, with project reviews.	Course documentation (project briefs), intensive system of tutorials, public reviews, group work, independent research and learning, presentations in small groups and publicly	Yes	Project work, presentation at reviews, exhibition, dissertation

Optional Modules Mapping of Learning Outcomes

Learning Outcome	Module Code
A1	ARC8040
A2	
A3	ARC8016, ARC8017
A4	ARC8015
B1	ARC8101, APL8001, ARC8015, ARC8016, ARC8017, ARC8040, DMS8001, DMS8002, DMS8006, DMS8007, COM8002, ICS8001, ICS8003, GEO8016, POL8029, POL8044, POL8048, SOC8046
B2	ARC8101, APL8001, ARC8015, ARC8016, ARC8017, ARC8040, DMS8001, DMS8002, DMS8006, DMS8007, COM8002, ICS8001, ICS8003, GEO8016, POL8029, POL8044, POL8048, SOC8046
B3	ARC8101, APL8001, ARC8015, ARC8016, ARC8017, ARC8040, DMS8001, DMS8002, DMS8006, DMS8007, COM8002, ICS8001, ICS8003, GEO8016, POL8029, POL8044, POL8048, SOC8046, TCP8934
B4	ARC8101, APL8001, ARC8015, ARC8016, ARC8017, ARC8040, DMS8001, DMS8002, DMS8006, DMS8007, COM8002, ICS8001, ICS8003, GEO8016, POL8029, POL8044, POL8048, SOC8046
C1	ARC8101, APL8001, ARC8015, ARC8016, ARC8017, ARC8040, DMS8001, DMS8002, DMS8006, DMS8007, COM8002, ICS8001, ICS8003, GEO8016, POL8029, POL8044, POL8048, SOC8046
C2	ARC8101, APL8001, ARC8015, ARC8016, ARC8017, ARC8040, DMS8001, DMS8002, DMS8006, COM8002, ICS8001, ICS8003, GEO8016, POL8029, POL8044, POL8048, SOC8046, COM8057
C3	ARC8101, APL8001, ARC8015, ARC8016, ARC8017, ARC8040, DMS8001, DMS8002, DMS8006, COM8002, ICS8001, ICS8003, GEO8016, POL8029, POL8044, POL8048, SOC8046, COM8057
C4	ARC8101, APL8001, ARC8015, ARC8016, ARC8017, ARC8040, DMS8001, DMS8002, DMS8006, COM8002, ICS8001, ICS8003, POL8029, POL8044, POL8048, SOC8046
D1	ARC8101, APL8001, ARC8015, ARC8016, ARC8017, ARC8040, DMS8001, DMS8002, DMS8006, COM8002, ICS8001, ICS8003, POL8029, POL8044, POL8048, SOC8046
D2	ARC8101, APL8001, ARC8015, ARC8016, ARC8017, ARC8040, DMS8001, DMS8002, DMS8006, COM8002, ICS8001, ICS8003, GEO8016, POL8029, POL8044, POL8048, SOC8046, TCP8934

D3	ARC8101, APL8001, ARC8015, ARC8016, ARC8017, ARC8040, DMS8001, DMS8002, DMS8006, COM8002, ICS8001, ICS8003, GEO8016, POL8029, POL8044,SOC8046, COM8057, TCP8934
D4	ARC8101, APL8001, ARC8015, ARC8016, ARC8017, ARC8040, DMS8001, DMS8002, DMS8006, COM8002, ICS8001, ICS8003, GEO8016, POL8029, POL8044, POL8048, SOC8046, COM8057, TCP8934